Telephone for Hazardous Locations

ResistTel
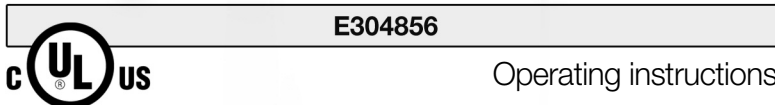
E304856	
c (UL) US	Operating instructions

FHF FUNKE+HUSTER·FERNSIG

Our telephone ExResistTel/ExResistTel ZB is a captivating product on account of its precision, convenience, long service life and reliability. It is freely programmable and the optimum choice for adverse ambient conditions. Be it seawater, high atmospheric humidity, dust or the toughest mechanical strains, the weather-resistant telephone accomplishes its aim in any conditions. The reason for this is the robust keypad made of V4A steel and an extremely solid housing made of impact-resistant and shockproof cast-moulding material. All of the components utilised are even resistant to leeches and lubricants. The 21-button V4A-steel keypad - which can be operated by a user wearing gloves - and the easily readable alphanumeric display as well as the uncomplicated menus all ensure simple operation - thus fulfilling the requirements for a leading-edge and operationally reliable means of communication. As a telephone suitable for connecting to the public telephone network and to private automatic branch exchanges, the ExResistTel always ensures reliable connections.

ExResistTel ZB is designed for telephone exchange operation and corresponds to the ExResistTel, except for keypad and display.

Note

Please read the operating manual carefully before installing the device. Please check the contents of the box for completeness.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.
Cet appareil est qualifié à être utilize en locaux classes Class I, Division 2, Groups A, B, C, D ou seulement dans les emplacements non-dangereux.

WARNING – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
AVERTISSEMENT – Déconnectez pas l´appareil avant que l´alimentation est mise hors tension ou l´emplacement est considéré à être non-dangereux.

WARNING – Explosion hazard – Substitution of any component may impair suitability for Class I, Division 2.
AVERTISSEMENT – Risque d´explosion – Remplacement d´aucun composant peut affaiblir aptitude pour Class I, Division 2.

Table of contents

General operating instructions

1. Both the ExResistTel telephone and the ZB version are designed for connection to dial ports with analogue connection points.
2. The handset is fitted with a stray-field coil for connecting hearing-aids. People who use hearing-aids which have an inductive receiver can receive the earphone signal directly.
3. The ZB version is not equipped with keypad and display, therefore not all the features are available with this version.
4. The ExResistTel has a handset module with a dry reed contact as a hook switch. In order to terminate an existing call connection, the handset must be hung up. In order to interrupt an existing call connection, it is sufficient to press the disconnect key on the keypad.(see page 12)
5. Use the menu to program the appropriate settings. To access the menu, pick up the handset and press the "YES" key.
6. If you take longer than 2 minutes before you begin making a choice, the power supply of the exchange may be switched off. If that occurs, you will no longer hear a dialling tone. In that case, please replace the handset and wait 2 seconds before picking it up again.
7. When a setting is stored successfully, this is confirmed by an acknowledgement tone.
8. When you receive a call, the ExResistTel rings at the ringer-volume level selected by you and, for the duration of the calling sound, the symbols (((▄))) appears on the display.
9. If you enter a PIN with the menu you can restrict or block settings and dial functions. Forgetting the PIN is the equivalent of losing a key. If you forget the PIN, please contact our technical support.

Customer information

This device has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules.

This device complies with part 68 of the FCC rules and with the standard TIA 968B.

The REN (Ringer Equivalence Number) is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total REN, contact the local telephone company. The REN is part of the product identifier and has the format REN n.n.B. The letter B denotes the ringer type.

If this telephone causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of

service may be required. But if advance notice isn´t practical, the tele-phone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the device. If it happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this telephone, for repair or warranty operation, please contact your supplier.

If the device is causing harm to the telephone network, the telephone company may request that you disconnect the device until the problem is resolved.

If you have specially wired alarm equipment connected to the telephone line, ensure the installation of this telephone does not disable your alarm equipment. If you have questions about what will disable alarm equip-ment, consult your telephone company or a qualified installer.

This telephone must not be used on party lines.

This telephone is of a type that is not intended to be repaired.

This telephone is hearing aid compatible (HAC).

Device

Device – construction

The two-part housing of ExResistTel consists of an electrostatically conducting compressed material into the top portion of which a stainless steel front plate is inserted. A cut-out closed with a sight glass in the front plate, is arranged over the display of the telephone.

A trough for incorporating cast electronic modules, as well as a connection compartment into which up to four leads can be introduced, is built into the box shaped lower part. The upper part with keypad and display section is compressed onto the lower part along with an intermediate circumventing gasket with the help of four screws and seals off the internal space.

Variant ExResistTel ZB notes ---

ExResistTel ZB is a variant of the telephone that has neither a display nor a keypad and can be used in centralised operation applications (ZB). Differing from the identical handling of incoming calls, the ZB variant is passive during outgoing calls. The private branch exchange used is responsible for dialling or establishing a voice connection, which should be configured accordingly if required.

Apart from the display and keypad, the variant ExResistTel ZB has the technical data of the standard variant ExResistTel at delivery. All keys, display and setting dependent statements in the operating manual do not necessarily apply to the ZB variant. The operation with a headset is also not possible. For a better overview, the use of an explicit identification such as "not applicable for the ZB variant" of all affected passages has been avoided.

Device – drawings of the housing

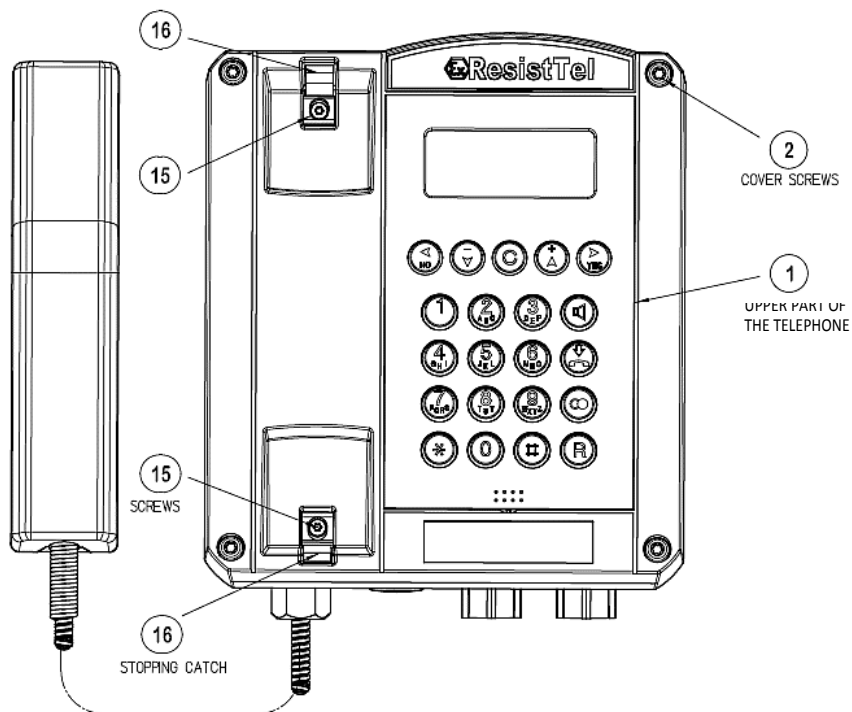**Figure 1 Set view.**

Device version ExResistTel ZB is not equipped with keypad and display. The front plate of this version is a closed stainless steel plate.
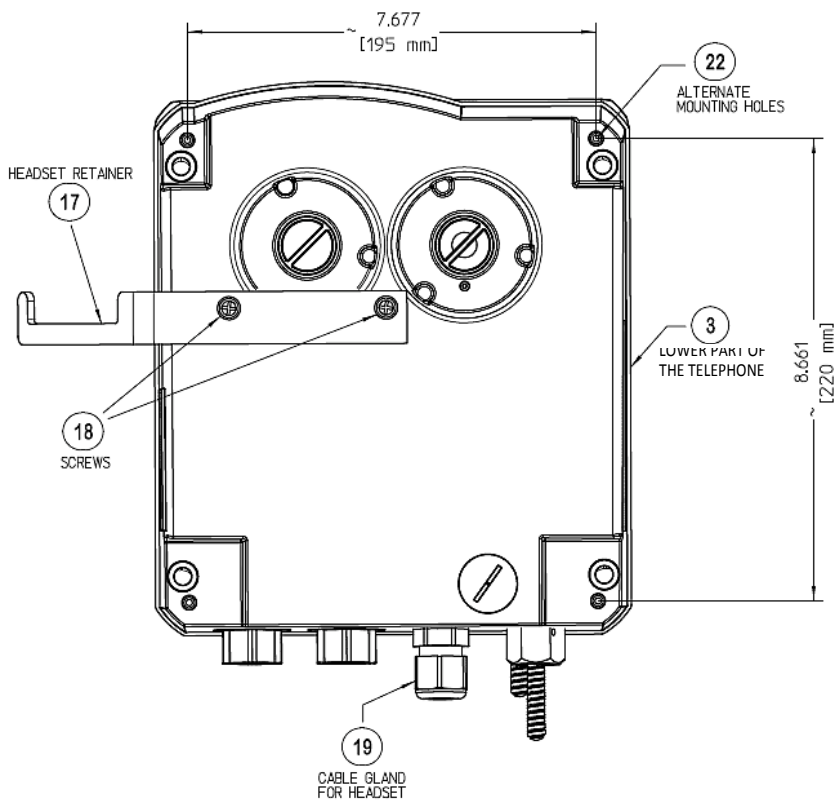
Figure 2 Outside view of telephone lower part.
Note: Pos. 17, 18 and 19 are only used when the headset is connected.

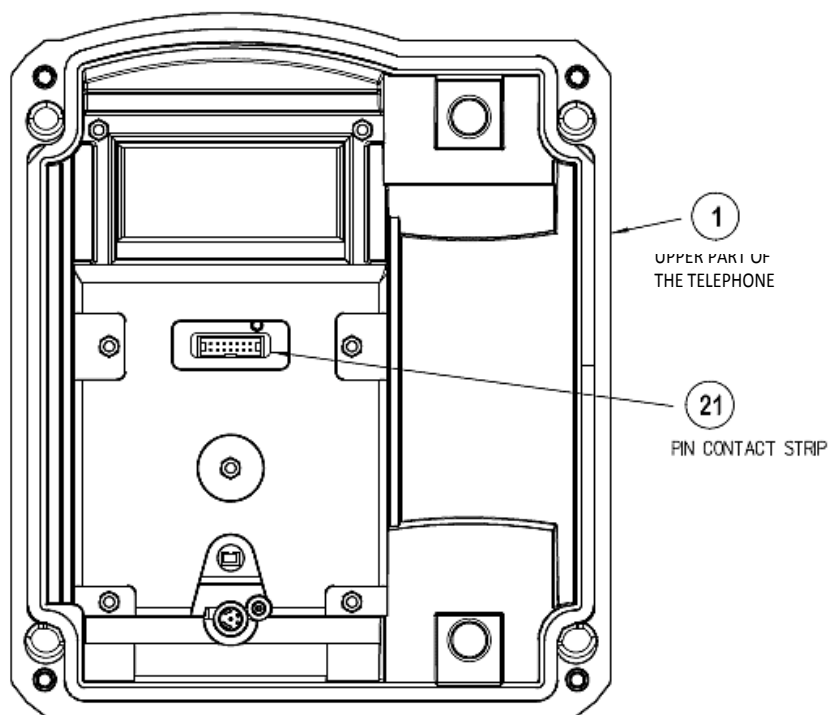**Figure 3 Inside view of telephone upper part.**
Note: The ZB version is not equipped with a pin contact strip.
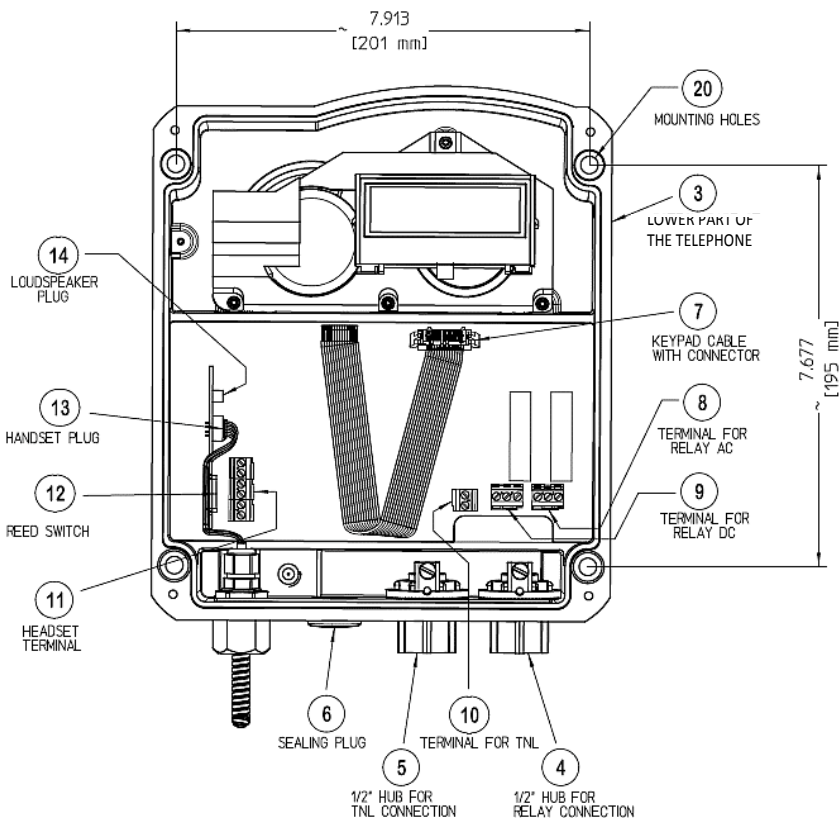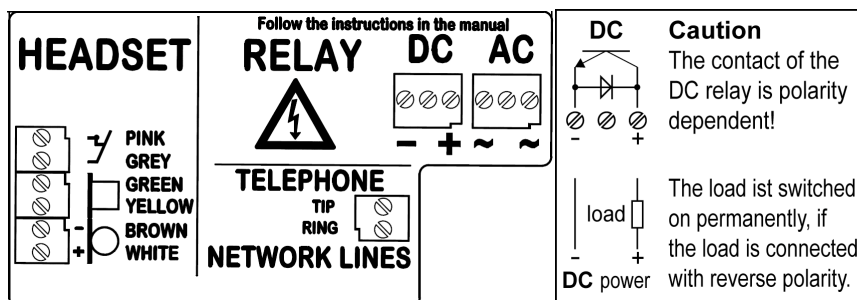
Figure 4 Inside view of telephone lower part and mounting holes
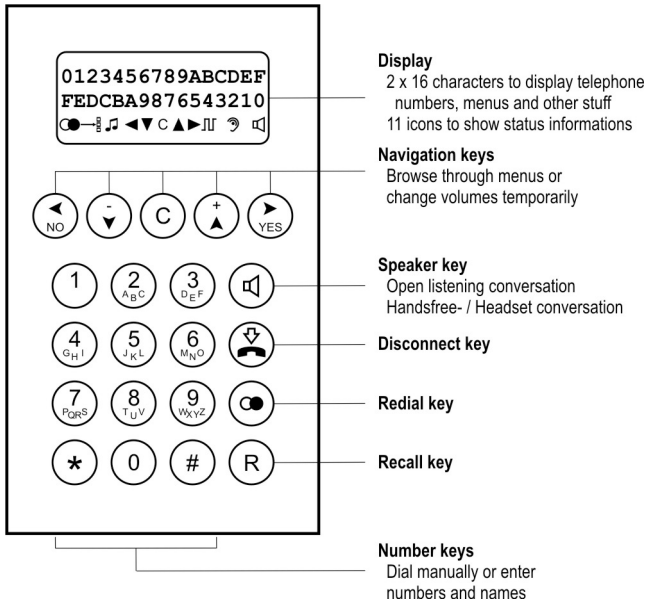For making a drilling template please see dimensions.

Device – connection diagram

Follow the instructions on page 23 of this manual for configuring the used relay.

Figure 6 Connection diagram

Device – display and keypad

Display
2 x 16 characters to display telephone numbers, menus and other stuff
11 icons to show status informations

Navigation keys
Browse through menus or change volumes temporarily

Speaker key
Open listening conversation
Handsfree- / Headset conversation

Disconnect key

Redial key

Recall key

Number keys
Dial manually or enter numbers and names

Display icons --

Symbol Meaning

◉   Key ◉ is active: dials the last dialled telephone number (call redial).

→⌷   *not used*

♫   Tone dialling is set.

◀[1]   Key⌣ is active: Opening of the menu "unlock" ↔ menu navigation

▼[1]   Key⌄ is active: Temporary reduction (-) of the volume ↔ menu navigation

c[1]   Key© is active: *not used* ↔ delete character

▲[1]   Key⌃ is active: Temporary increase (+) of the volume ↔ menu navigation

▶[1]   Key⌣ is active: Opening of the "main menu" ↔ menu navigation

Ⅱ   Impulse dialling is set.

👂   The conversation takes place in the mode: *Headset*.

◁   The conversation takes place with the loudspeker on in the mode *Open Listening* or *Handsfree*.

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[1] Key function changes depending on state. Statements describe the key function in the basic state or with open menu. (Key x is active: basic state ↔ menus).

Key functions --

⊙⊙ⓒ⊙⊙	Temporary volume setting and menu control ☞ *S 12, Display icons*
①②③ ④⑤⑥ ⑦⑧⑨ ⋆⓪# ¹	Manual dialling or entry of numbers and text. ☞ *S 18, Operation – making calls* ☞ *S 28, Menu – using input lines*
◁	Control of the conversation-mode. ☞ *S 17, Operation – conversation modes*
☻	Disconnecting a connection with handset lifted.
⦿	Redialling the last dialled telephone number. ☞ *S 18, Operation – making calls*
® ²	Introducing a query. ☞ *S 18, Operation – answering calls* ☞ *S 18, Operation – making calls*

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¹ For text entry, the key # enables switching between upper case- [ABC] and lower case [abc]. ☞ S 28, Menu – using input lines

² For telephone number entry, the key ® enables the entry of special dialling characters (R, A, B, C, D, - & T). ☞ S 28, Menu – using input lines

Notes:

▪ Automatic key repetition of the telephone is active on opening of menu functions. After an initial delay of 500 ms, key events are repeated at an interval of 125 ms as long as the key is pressed. This way, the browsing of the telephone directory, the adjusting of sliding controllers, the shifting of cursor positions etc. is simplified.

Device – mounting and installation

a) The device may only be installed on an even surface and in a vertical position. Provide the selected area of installation with suitable holes for fastening the device. The diameter of the drilled hole is dependent on the screw employed (screw diameter max. 5/16" [8 mm]) and the type of supporting base material (steel, wood, concrete, plasterboard etc.) and must be chosen accordingly.
    ☞ S 11, Figure 4 Inside view of telephone lower part ..

b) Loosen (2) cover screws, pull out plug connectors (7)*☞ Figure 4,* of the flat cable from the pin contact strip (21)*☞ Figure 3,* of the upper part of the telephone (1) and take off the upper part.
    ☞ S 8, Figure 1 Set view

In case headset accessory is used.

c) Screw on the (17) handle from the accessory packing with the help of the two supplied screws (18) onto the rear side of the telephone (3).
    ☞ S 9, Figure 2 Outside view of telephone lower part

d) Remove sealing plugs (6) from the lower part of the telephone (3) and screw in cable entry gland M20x1.5 (19)*☞ Figure 2,* from the accessory packing.
    ☞ S 11, Figure 4 Inside view of telephone lower part and mounting holes

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e) Insert screws with head diameters of 0.3937 in [10 mm] to 0.51181 in [13 mm] in the openings (20) of the lower part of the telephone (3) secure the lower part of the telephone (3) onto the prepared installation surface.
    ☞ S 11, Figure 4 Inside view of telephone lower part and mounting holes

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In case headset accessory is used.

f) Pass the prefabricated connecting cables from the accessory packing through the cable entry gland M20x1.5 (19) and fix them with the help of the screw fasteners.
    ☞ S 9, Figure 2 Outside view of telephone lower part

g) Place the cable core ends of the connecting cables on the terminals located in the section HEADSET of the connecting diagram. The terminals are labelled with the cable core colours of the connecting cables.
    ☞ S 11, Figure 6 Connection diagram

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h) Pass and fix the connecting cables of the telephone through the cable entry glands (5).
    ☞ S 11, Figure 4 Inside view of telephone lower part and mounting holes

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i) Place the tip/ring cable core ends of the connecting cables on the terminals located in the section TELEPHONE NETWORK LINES of the connecting diagram and marked as TIP or RING.
☞ *S 11, Figure 6 Connection diagram*

In case relay contacts are used

j) Pass and fix the switching contact connecting cables through the cable entry glands (4).
☞ *S 11, Figure 4 Inside view of telephone lower part and mounting holes*

k) Place the cable core ends of the switching contact connecting cables on the RELAY of the connecting diagram. In the case of a DC-load, terminals labelled as DC or DC+ must be used; in case of AC switching load, the two terminals labelled AC ~ must be used.
☞ *S 11, Figure 6 Connection diagram*

l) Check for proper sealing before placing the upper part of the telephone.

m) Insert the plug connectors (7) of the flat cable into the pin contact strip (21) of the telephone upper part (1) and place the upper part on the telephone lower part (3).

n) Fix the telephone upper part (1) with the four cover screws (2).

Device – adjusting sling holder

The holding strength for the handset is continuously adjustable. Loosen the screws (15) and move the stopping catches (16). Pushing the stopping catches together increases the holding strength whereas pulling them apart reduces it. Tighten the screws again.

Device – start-up

The ExResistTel telephone is ready for operation as soon as it has been connected to the telephone network.

Device – maintenance

The ExResistTel telephone contains no parts that have to be maintained.

As delivered condition – box contents

The scope of delivery includes:
- ExResistTel telephone
- this operating manual
- 2 self-adhesive lettering

As delivered condition – default settings

To enable you to use the telephone immediately after connecting it, we have made default settings for general utilisation purposes.
Using the menu, you can alter these default values in accordance with your own personal necessities and connection requirements.

Upon delivery of the telephone, the following default values are set:

- Phone book   empty
- Ringer volume   6
- Ringer melody   0
- Handset volume   1
- Headset volume   2
- Open listening volume   5
- Handsfree volume   5
- Dialing mode   Dual Tone Multi Frequency (DTMF) signal duration 90 ms
- Exchange code   empty
- Pause after
  exchange code   1 second
- F-Relay   both relays AC/DC are steadily off
- Menu language   English
- Welcome text   none
- LCD contrast   5
- PIN   0000
- Telephone lock   off
- Direct call number   empty
- Menu lock   off
- Last number redial   empty
- Recall key function   flash duration 120 ms

Using the programming menu, you may reset the settings to their defaults at any time.

Operation – conversation modes

Types of conversation-operations for telephone calls that are available to you are listed below. To set and change the selected types of operation, the handset and speaker key Figure 7 must be operated as shown.
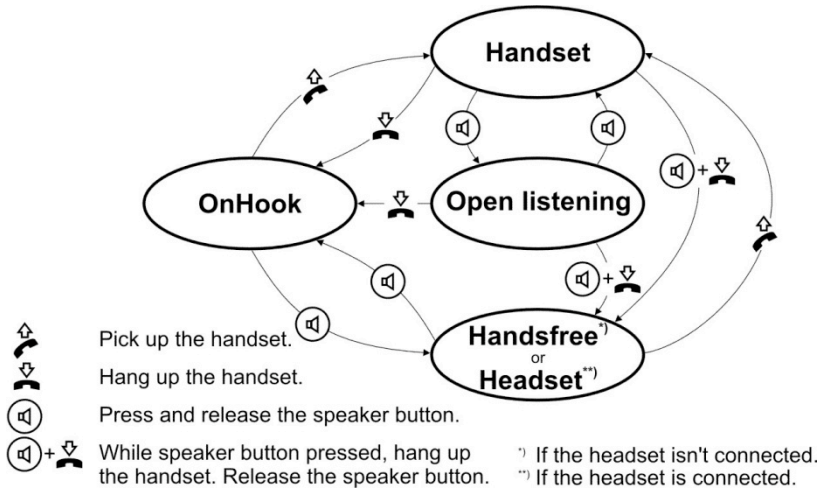

Figure 7 Conversation modes of the ExResistTel.

Handset conversation mode

The conversation must be conducted over the microphone and earpiece of the lifted handset; the speaker is switched off.

Open listening conversation mode

The conversation must be conducted over the microphone and earpiece of the lifted handset. Persons present can listen in to the conversation over the switched-on speaker.

Handsfree conversation mode

The conversation must be conducted over the microphone that is located below the keypad and the switched-on speaker. Persons present can listen in to the conversation and participate actively in it.

Headset conversation mode

The conversation must be conducted over the microphone and earpiece of the connected headset; the speaker is switched off.

Operation – answering calls

The telephone signals an incoming call. Lift the handset or press the speaker key to accept the call in the conversation-operation type preferred by you. The greeting message appears in the display and the connection to the calling party is established.
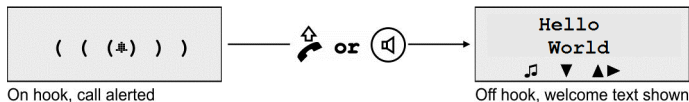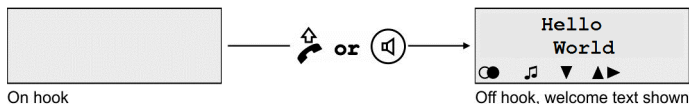
(((♠)))	⚡ or ◁))	Hello World ♪ ▼ ▲▶
On hook, call alerted		Off hook, welcome text shown

-------Conversation------

▼   Temporarily lower the volume for the duration of the call.

▲   Temporarily raise the volume for the duration of the call.

R   Make a query.

Operation – making calls

Lift the handset or press the speaker key to make the call in the conversation-operation type preferred by you. The greeting message appears in the display and you will hear the dial tone (dial ready tone) of the public telephone network or of the private branch exchange. Dial the telephone number of the dialogue partner.

	⚡ or ◁))	Hello World ⊙ ♪ ▼ ▲▶
On hook		Off hook, welcome text shown

-----------Dialling----------

⓪ .. ⑨   Manual entry and simultaneous dialling of the telephone number.

⊙   Dialling the last dialled telephone number.

▶x 2   set telephone number in telephone directory manually ⊙ | ⊙ or by entry of a search word ⌨ and trigger dialling procedure with 1-2 ⊙ key operations.

☞ S 29, Menu – using phone book

-------Conversation------

▼   Temporarily lower the volume for the duration of the call.

▲   Temporarily raise the volume for the duration of the call.

R   Make a query.

Operation – when the phone is locked

In the case of active telephone lock, dialling is restricted or completely blocked. The lock, which is active, will be shown as follows in the second line of the display on shifting to the selected conversation-operation.

Phone Book Only those telephone numbers listed in the telephone directory can be dialled. For this, the telephone directory must be opened by key activation⊙, the chosen telephone number set manually ⊙ | ⊙- or by entering a search word 🔘 and triggering the dialling by activating a key⊙. ☞ *S 29, Menu – using phone book*

Direct Call Only the numbers listed in the *MainMenu\PhoneLock\DirectCallNo* can be dialled. For this, any key except the keys ⊙ and ⓓ can be pressed to trigger the dialling.

Total Lock Dialling is completely blocked.

On hook ──── 📞 or (ⓓ) ──── Off hook, lock state shown

```
♬♬♬Phone Lock♬♬♬
    Direct Call
  ♬ ◀▼ C ▲▶
```
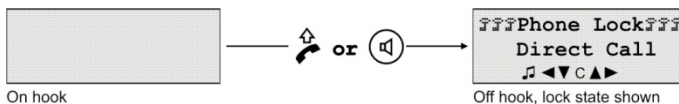
------ Conversation ------

(⊙)   Opens the "Unlock" menu with which the telephone lock can be deactivated.

(⊙)   Temporarily lower the volume for the duration of the call.

(⊙)   Temporarily raise the volume for the duration of the call.

```
-----Unlock-----
> for good
  this once

======End======
```

Menu "Unlock"

Deactivates the telephone lock permanently.

Deactivates the telephone lock for the duration of the current connection.

Configuration

The ExResistTel is provided with a menu with which the different properties of the telephone have to be adapted to the prevailing operating conditions. This menu marked "Menu Main" is to be opened pressing the key⊙. Adjustable properties, their factory settings and adjustment ranges are explained in detail below. Explanations such as those required for setting of required menu elements, can be found in
☞ *S 26 Menu.*

Configuration - Main Menu (Overview)

```
Main Menu
+-Phone Book......"":50x(16+32)    0-50 alphabetically listed name/number entries
+-Settings
  +-Ringer                         Alerting of incoming calls.
    |-Volume.............6|0-6      - Volume. Set to 0, to mute the ringer!
    |-Melody.............0|0-9      - Melody
  +-Volume                         Initial volume of the conversation
    |-Handset............1|1-7      - Handset
    |-Headset............2|1-7      - Headset
    |-Open Listening.....5|1-7      - Speaker of open listening
    |-Handsfree..........5|1-7      - Speaker of handsfree
  +-Dialing Mode.........1|0-3     Dialing method
    |-( ) Dtmf unlim               - Tone dialing, tone present while key pressed
    |-(●) Dtmf 90 ms               - Tone dialing, tone present for 90 ms
    |-( ) Pulse 1.5:1              - Pulse dialing, Break/Make-Ratio 1.5:1
    |-( ) Pulse 2.0:1              - Pulse dialing, Break/Make-Ratio 2.0:1
  +-Pbx/Pstn                       Settings concerning the Pbx/Pstn
    |-Exchange Code......."":5      - Exchange code of the pbx
    +-Flash Duration.....1|0-2      - Loop break duration of a (R) keystroke
    | |-( )    80 ms               *   80 ms
    | |-(●) 120 ms                 * 120 ms
    | |-( ) 600 ms                 * 600 ms
    +-Pause ExchCode.....0|0-4      - Pause duration after dialing the exchange code
      |-(●) 1.0 s                  * 1.0 s
      |-( ) 2.0 s                  * 2.0 s
      |-( ) 3.0 s                  * 3.0 s
      |-( ) 4.0 s                  * 4.0 s
      |-( ) 5.0 s                  * 5.0 s
  +-F-Relay..............0|0-4     Options of the function relay.
    |-(●) Off                      - Relays AC/DC are steadily off
    |-( ) AC:Ringer                - Relay AC turns on while the phone rings
    |-( ) AC:Off Hook              - Relay AC turns on while the phone is off hook
    |-( ) DC:Ringer                - Relay DC turns on while the phone rings
    |-( ) DC:Off Hook              - Relay DC turns on while the phone is off hook
  +-Menu                           Settings concerning the menu
    +-Language...........0|0-5      - Display language
    | |-(●) English                * English
    | |-( ) Español                * Español
    | |-( ) Português              * Português
    | |-( ) Français               * Français
    | |-( ) Italiano               * Italiano
    | |-( ) Deutsch                * Deutsch
    |-Welcome Text......."":32      - Contents of the display, when turned off hook
    |-LCD Contrast.......5|0-9      - Contrast of the display
  |-Fact. Settings                 - Action button to restore the factory settings
  |-PIN..............."0000":4     - PIN. Set to ≠ 0000, to enable the protection!
+-Phone Lock                       Phone lock utility
  +-Activate............0|0-3      - Options of the phone lock utility
    |-(●) Off                      * Phone lock is disabled
    |-( ) Phone Book               * Restricted to the numbers of the phone book
    |-( ) Direct Call              * Restricted to the direct call number
    |-( ) Total                    * Dialing of any number is disabled
  |-Direct Call No......."":32      - Associated number of the direct call lock
+-Menu Lock.............0|0-1      Options of the menu lock utility
  |-(●) Off                       - Menu lock is disabled
  |-( ) On                        - Hide all menus, which could result in changes
+-Version                         Action button to show the version info


              FV|Min-Max    Factory setting, minimum- and maximum value.
              FS:MaxLen     Factory setting and maximum string length.
```

Configuration - Phone Book

With menu element `Phone Book`, the telephone directory application that takes care of 50 subscriber entries, can be opened. The name and telephone number of each entry can be a maximum of 16 or 32 characters long. ☞ *S 29, Menu – using phone book*

Ex-factory, the telephone directory is completely empty.

Factory setting:

```
Name ............................... 50 x "":16    // blank
Calling Number............ 50 x "":32    // blank
```

Configuration - Ringer

With the slide controls, `Volume` and `Melody` volume and melody of the acoustic call signal can be set.

Notes:

- Volume setting 0 activates the switching off or muting of the acoustic call signalling.

Factory setting:

```
Melody ................................................0    // volume optimized, intermittent tone
Volume ................................................6    // maximum volume
```

Configuration - Volume

The initial volumes for conversation-operations of the same name must be set with the four slide controllers. During a telephone-meeting, the set volumes can be temporarily changed with the keys ⊙ and ⓘ .

Factory setting:

```
Handset .............................................1    // standard setting
Headset .............................................2    // standard setting
Open Listening...............................5    // standard setting
Handsfree.........................................5    // standard setting
```

Configuration - Dialing Mode

The selected dialling mode must be set with the option switch `Dialing Mode`; the following procedures are available.

`Dtmf unlim`	tone dialling procedure with continuous tone duration. The procedure works only for manual dialling modes and causes the signal tone to be on as long as the corresponding key is pressed, however at least for 90 ms. The intermediate signal pause duration is fixed for 90 ms. All automatic dialling procedures are carried out with the setting "Dtmf 90 ms".
`Dtmf 90 ms`	tone dialling procedures to be set with the following time settings. T_dtmf_std_dd 90 ms // signal duration T_dtmf_std_idp 90 ms // intermediate signal-pause duration
`Pulse 1.5:1`	pulse dialling procedures to be set with the following time settings. T_pulse_bapt_db 60 ms // signal-break-duration T_pulse_bapt_db 40 ms // signal-make-duration T_pulse_bapt_idp 800 ms // intermediate signal-pause duration
`Pulse 2.0:1`	pulse dialling procedures to be set with the following time settings. T_pulse_bs_db 67 ms // signal-break-duration T_pulse_bs_dm 33 ms // signal-make-duration T_pulse_bs_idp 830 ms // intermediate signal-pause duration

Factory setting:

`Dialing Mode` ....`Dtmf 90 ms`   // frequently used dialling procedure

Configuration - PBX\PSTN

Calls to the PSTN

To call subscribers in the public telephone network, the access number of the public network must be entered before the subscriber number and a dialling pause awaited before the dialling of the subscriber in the public telephone network can start. These unit specific characteristics must be set with the entry element `Exchange Code` and the option switch `Pause ExchCode`.

In the factory, the access number is set blank (""), whereby the automatic insertion of a dialling pause is switched off.

Inquiries

To initiate additional services of the public network or the private branch exchange, the loop current must be momentarily interrupted. With the option switch `Flash Duration`, the duration of interruption of the loop current, which is set when operating the query key Ⓡ, can be specified.

Factory setting:

`Exchange Code` ....`""`:5   // blank, insertion of dialling pause inactive
`Flash Duration` ....`120 ms`   // standard setting
`Pause ExchCode` ....`1 s`   // standard setting

Configuration - F-Relay

The operation of the F-relay AC and DC must be specified with the option switch `F-Relay`; the following operations are available.

`Off`	Both F-relays remain permanently switched off.
`AC:Ringer`	The F-relay AC signals an incoming call and switches on and off in the rhythm of the call voltage, without call pause bridging.
`AC:Off Hook`	The F-relay AC signals the busy status of the telephone and is on as long as the telephone occupies the TIP/RING-line.
`DC:Ringer`	The F-relay DC signals an incoming call and switches on and off in the rhythm of the call voltage, without call pause bridging.
`DC:Off Hook`	The F-relay DC signals the busy state of the telephone and is switched on as long as the telephone occupies the TIP/RING-line.

Factory setting:

`F-Relay`... `Off`   // both relays permanently switched off.

Configuration - Menu

The menu contains the following elements with which the illustration in the display of the telephone must be specified.

`Language`	Options switch for specifying the language.
`Welcome Text`	Entry element for specifying the greeting text, which is depicted initially in the display, if the telephone changes to one of the conversation-operations.
`LCD Contrast`	Sliding controller for specifying the display contrast.

Factory setting:

`Language`...............................`English`   // standard setting
`Welcome Text`.....................`""`:32   // standard setting
`LCD Contrast`...................................5   // standard setting

Configuration - Fact. Settings

With the action switch `Fact. Settings`, the factory setting of the configuration are reset.

Notes:

- The following elements of the configuration remain unaffected by the resetting of the factory settings.
  ☞ *S 21, Configuration - Phone Book*
  ☞ *S 23, Configuration - Menu\Language*
  ☞ *S 24, Configuration - PIN*

Configuration - PIN

With the entry element `PIN,` the personal identification number, which must be entered on request of the PIN to authorise oneself to make changes to the configuration, must be specified.

Notes:

- The factory setting "0000" causes the switching-off of the PIN-protection; configuration settings may be changed without request of the PIN.
- A successful response to the PIN request remains in place until the menu is terminated. Further changes can be made without a repeated request of the PIN.
- If you change the PIN, don´t forget the new PIN. Forgetting the PIN is the equivalent of losing a key. If you forget the PIN, please contact your distributor or manufacturers representative.

Factory setting:
```
PIN...................................... "0000":4    // 0-Pin, change without PIN request!!!
```

Configuration - Phone Lock

With the option switch `Activate,` specify whether, and in which manner, the telephone is locked and the choice of telephone numbers is limited. In addition to the limitation of choice, the access to the main menu, with the telephone in locked mode, is blocked. Disabling of the lock is undertaken in the unlock menu, which can be opened by pressing the key ☺. ☞ *S 19 Operation – when the phone is locked.* The following locks are available.

`Off`	Telephone lock is inactive.
`Phone Book`	Telephone is locked, only the numbers in the telephone directory can be dialled.
`Direct Call`	telephone is locked, only numbers with specified entry element `Direct Call No` can be dialled.
`Total`	Telephone is locked, no dialling possible.

Notes:

- Putting the locks `Phone Book` and `Direct Call` assumes that the telephone directory or the direct call numbers are not blanked out.

Factory setting:
```
Activate......................................Off    // Telephone lock is inactive.
Direct Call No........................"":32    // Blank
```

Configuration - Menu Lock

Specify whether all elements that can change the configuration are removed from the menu depiction with the option switch `Menu Lock`. Following options are available.
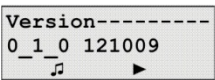
`Off`   Menu lock is inactive.

`On`   Menu is locked, no change of the configuration possible.

Factory setting:

`Menu Lock`..................................... `Off`   // Menu lock is inactive.

Configuration - Version

With the action switch `Version`, the following display, that has information on the version of the telephone, can be requested.

```
Version---------
0_1_0 121009
    ♫       ►
```
Message box "Version"

`hh_vv_rr yymmdd`   **// Information format**

`hh` Hardware identifier
`vv` Software version number
`rr` Software release number
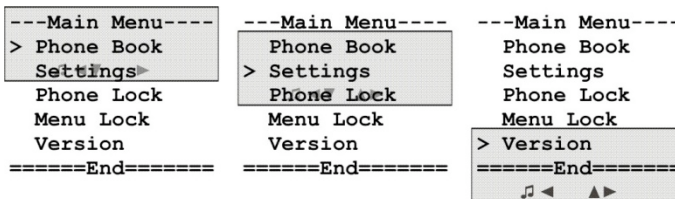`yy` Year of the release
`mm` Month of the release
`dd` Day of the release

Menu

Menu – used confirmation-, error- and advisory tones

▬▬▬   Confirmation tone (600 ms), signals the successful completion of an operating action.

■ ■ ■ ■   Error tone (700 ms), signals the failure induced rejection of an operating action.

⬎   PIN-Ping (150 ms), signals the request for entry of the PIN.

■   Auto-Ping (100 ms), signals the AutoEdit status of an entry element

Menu – using menus

Menus serve the navigation through the setting elements of the telephone configuration. The opened menu constitutes a list of entries, which are arranged between the title line and the end line, from which exactly one entry is selected. The selection, depicted by the symbol > in column 1, must be moved forwards or backwards on the item with the keys ⊙ and ⊙, for the action that is associated with it to be carried out, if key ⊙ is pressed. Possible actions are menus, sliding controllers, option switches, entry elements, the telephone directory and action commands.

```
---Main Menu----    ---Main Menu----    ---Main Menu----
> Phone Book          Phone Book          Phone Book
  Settings▸         > Settings            Settings
  Phone Lock          Phone Lock          Phone Lock
  Menu Lock           Menu Lock           Menu Lock
  Version             Version           > Version
======End=======    ======End=======    ======End=======
                                           ♪ ◄    ▲ ►
```

List representation in two-line display (shaded areas represent the display).

⊙ Abort

⊙ Selects the next menu entry.

⊙ Selects the previous menu entry.

⊙ Carries out the action connected with the selected menu entry.

Notes:

- The number of entries in menus can vary depending on the context. For example, the number of entries in the main menu with activated menu lock and deleted telephone directory reduces to 2.

- The menu system is equipped with a time monitor that automatically ends the menu within 30 s if there is no user activity.

Menu – using sliders

Slide controllers change the properties with incremental character, e.g. speaker volume settings. The opened slide controller shows the entry range as a horizontal bar, into which the current set value is superimposed. With the keys ⊙ and ⊙ the slide controller can be lowered or raised to the value at which it is to be saved by pressing the key ⊙ .
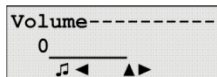
```
Volume----------        Volume----------        Volume----------
     0                        3                        6
    ♪ ◄      ▲►            ♪ ◄▼    ▲►             ♪ ◄▼     ►
Minimum setting         Any setting             Maximum setting
```

⊙ Abort

⊙ Lowers the property value by one unit.

⊙ Raises the property value by one unit.

⊙ Ends the setting and saves the changed property value

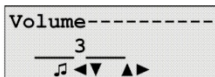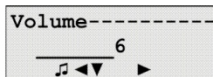## Menu – using options

Option switches change properties from which a choice of one out of a range of 1 to N must be made, e.g. the setting of the menu language. The opened option switch appears as a list with N named options, in front of which is a button symbol ( ) or (●). Here, the (●) shows the current set option, whereas the symbol ( ) shows the other N-1 options as unmarked. With the keys ⊙ and ⊙ that option that is to be selected is marked and saved by pressing the key⊙.
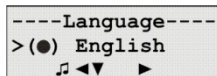
```
----Language----        (●) English
>(●) English            >( ) Español
   ♪ ◄▼     ►              ♪ ◄▼  ▲►
Selected and marked option   Selected option
```
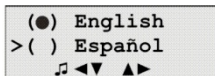
⊙ Abort

⊙ Selects the next option.

⊙ Selects the previous option.

⊙ Marks the selected option and saves the changed property value.

Menu – using input lines

Entry elements change properties with which strings are processed, e.g. during specification of telephone numbers. The opened entry element usually appears as a title line, under which the display section is located, in which the entry is made with one of the following key strings/character strings. The character entry takes place at the position of the cursor, which usually works in the overwrite or insert mode and automatically changes to block mode or overwrite mode in case the entry reaches the maximum length of the property. The cursor position can be shifted with the keys $\bigcirc$ and $\bigcirc$; key $\bigcirc$ enables the deletion of individual characters.

Key strings / Character strings:
- Numbers: (0), (1), (2), (3), (4), (5), (6), (7), (8), (9), (*), (#), (R)
- Text: (0), (1), (2), (3), (4), (5), (6), (7), (8), (9)
- PIN: (0), (1), (2), (3), (4), (5), (6), (7), (8), (9), (*), (#)

Name-------[abc]
Foxtrot_
   ♫ ◄▼C ►
	Calling Number--
	◄567890T007ABCD_
	   ♫ ◄▼C ►
		Calling Number--
		012345678**9**
		   ♫ ◄▼C▲

Text input in lowercase letters	Beginning of input obscured	"Piep" --> AutoEdit mode

$\bigcirc$ Abort

$\bigcirc$ Shift the cursor one character to the left.

$\bigcirc$ Delete character before the cursor (backspace)

$\bigcirc$ Shift the cursor one character to the right.

$\bigcirc$ Ends the entry and saves the changed property value.

-------- Optional --------

$\bigcirc$ Switching between upper case [ABC] and lower case [abc] for text entries, in case the title line contains the superimposition [ABC] or [abc], which illustrates the current mode of upper or lower case.

$\bigcirc$ Entry of special dialing characters during entry of telephone numbers.
R   Flash, interrupts the TIP/RING-line for the duration set with parameter `Flash Duration`. ☞ *S 22, Configuration – PBX\PSTN\Inquiries*
A   DTMF-dial mark "A".
B   DTMF-dial mark "B".
C   DTMF-dial mark "C".
D   DTMF-dial mark "D".
-    Pause, interrupts the dial procedure for the duration set with parameter `Pause ExchCode`. ☞ *S 22,Connection – PBX\PSTN\Calls to the PSTN*
T   Temporary switch over to tone dialling procedure..

Notes:

▪ If the length of the entry exceeds the width of the display section, the entry in the display is scrolled horizontally. The shortcoming of the display is pointed out by blending-in the character ◄ at the beginning and/or ► at the end of the section.

- With the opening of an entry dialogue, all old entries are shown in AutoEdit-mode, which is indicated by a blinking overwrite-cursor ▌ on the last entered character and is accompanied by a short beep-tone. To completely delete an old entry or to replace it with a new one, only the key ©- or one of the entry keys need to be pressed. On the other hand, the old entry is retained if the AutoEdit mode is terminated by pressing the cursor keys ⊙ or ⊙.

Example:

12345▣	—©→ _	// old input deleted
12345▣	—⑦→ 7_	// old input replaced by 7
12345▣	—Ⓐ—⑦→ 1234567_	// old input extended by 7
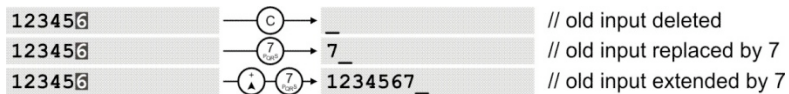
- The keys marked ⊛ are allotted to character strings whose characters are inserted one after the other in the cursor-position if the key is operated consecutively. Here, with the first keystroke, the cursor switches over to the block mode or overwrite mode and remains in this position until another key is pressed or the Abc-key time limit (1s) elapses. After that, the cursor returns to the original mode and positions itself behind the last entered character.

Example:

Foxtr_   Foxtrm   Foxtrn   Foxtro   Foxtrot   Foxtrot_

Menu – using phone book

The telephone directory shows the alphabetically arranged list of entered subscribers, waits for the selection of a subscriber and opens, on pressing the key ⊛ the menu "Entry", out of which the action to be taken on the selected subscriber entry must be chosen. For the selection of the subscriber, the keys ⊙ and ⊙- or the keys ⊛ of the text character-key string can be used. The latter allows the entry of a search term with which the telephone directory searches and selects the subscriber whose name most closely resembles the search term.

`---Phone Book---`
`> Alpha`
`      ♫◄▼    ►`
	`> Foxtrot`
	`  Golf`
	`   ♫◄▼ ▲►`

1st subscriber selected	xth subscriber selected

`> Tango`
`Search: T_`
`   ♫◄▼  ▲►`

Search result 1 x 🎤

(⌫) Abort

(▼) Selects the next subscriber.

(▲) Selects the previous subscriber.

(▶) Terminates the selection and opens the menu "Entry", which includes all actions that can be applied to the entry of the selected subscriber.

(letter) The entry of a search term used for the selection of the subscriber whose name most closely resembles the search term.

`-----Entry------` 	Menu "Entry"
`> dial`	Dials the telephone number of the selected subscriber
`  Change`	Opens entry dialogues one after the other to change the name and/or telephone number of the selected subscriber and positions the changed entry according to its alphabetical order.
`  Add`	Opens entry dialogues one after another to create name and telephone number of a subscriber and add the new entry according to its alphabetical order to the telephone directory.
`  Delete`	Deletes the entry of the selected subscriber from the telephone directory
`  delete all` `======End======`	Deletes all entries from the telephone directory

Notes:

- The opening of the entry menu does not take place if the telephone directory or menu lock has been activated, the telephone number of the selected subscriber is dialled directly by pressing the key ⊙ .

- The menu "Entry" contains only the actions that are applicable in the current context. For example, if "add" is the only actions applicable in case of a completely deleted telephone directory, whereas "add" is invalid if no vacant telephone directory slots are available.

Technical Data

Parameter / Test condition		Min	Type	Max	Unit
$V_{OpenLoop}$	Open loop voltage (OnHook)	24		56.5	V_{DC}
I_{Loop}	Loop current (OffHook)	15		110	mA_{DC}
V_{Ringer}	Ringer voltage	30		150	V_{AC}
f_{Ringer}	Ringer frequency	15.3		68	Hz
REN	Ringer equivalence number		1.8		-
RT68	Ringer type acc. FCC Part 68		B		-
Tip/Ring loop impedance					
Z_{LoopDC}	DC loop impedance@I_{Loop} = 25 mA_{DC}		320		Ω
$Z_{LoopDyn}$	Dynamic loop impedance		600		Ω
$R_{OpenLoop}$	Open loop resistance (Flash, pulse dialing etc.)	5			$M\Omega$
Z_{Ringer}	Ringer impedance@V_{Ringer} = 62 V_{AC}	5			$k\Omega$
Audible properties					
L_{Ringer}[1]	Ringer volume range, adjustable in 5 steps. 10 melodies available An additional 6th step turns the ringer muted.	60		90	dB(A)
L_{Beeper}	Confirmation-, error and advisory beeps.		tbd		dB(A)
$L_{Handset}$	Handset volume, adjustable in 6 steps.	0		12	dB
$L_{Headset}$	Headset volume, adjustable in 6 steps.				dB
$L_{OpenListng}$	Open listening volume, adjustable in 6 steps.	56		68	dB(A)
$L_{Handsfree}$[2]	Handsfree volume, adjustable in 6 steps.	56		68	dB(A)
Dialing properties					
- Tone dialing@Dialing mode = `Dtmf 90 ms`					
$L_{DtmfLowG}$	Loop level DTMF low frequency group		-11		dBm
$L_{DtmfHighG}$	Loop level DTMF high frequency group		-9		dBm
$L_{DtmfPreem}$	DTMF pre-emphasis	2			dB
T_{DtmfDD}	DTMF digit duration	90			ms
$T_{DtmfIDP}$	DTMF inter digit pause	90			ms
- Pulse dialing@Dialing mode = `Pulse 1.5:1`					
$T_{PulseDB}$	Pulse break duration		60		ms
$T_{PulseDM}$	Pulse make duration		40		ms
$T_{PulseIDP}$	Pulse inter digit pause		800		ms
- Pulse dialing@Dialing mode = `Pulse 2.0:1`					
$T_{PulseDB}$	Pulse break duration		67		ms
$T_{PulseDM}$	Pulse make duration		33		ms
$T_{PulseIDP}$	Pulse inter digit pause		830		ms
- Recall signalling					
$T_{FlashDB}$	Loop break duration	80		600	ms
Handset					
	Material	Glass-fibre-reinforced polyester			
	Cord	Steel-reinforced steel-clad cord made of V4A.			
	Microphone capsule	Electret microphone			
	Earphone capsule	Dynamic capsule with stray-field coil for the inductive connection of hearing-aids.			
T_{Noise}[3]	Noise suppression	3			dB

Parameter / Test condition			Min	Type	Max	Unit
Housing						
	Material		Glass-fibre-reinforced polyester			
l_{HxWxD}	Dimension	Height		10.236 260		in mm
		Width		8.976 228		in mm
		Depth		8.976 135		in mm
m		Weight		12.13 5.5		kg
CS_{Term}	Terminal connection capacity	solid			12 4.0	AWG mm^2
		stranded			14 2.5	AWG mm^2
F-Relay						
DC- Type: DC60MP						
V_{Load}	Load voltage range		5		60	V_{DC}
I_{Load}	Load current				3	A_{DC}
$V_{Dropout}$	Dropout voltage@$I_{LoadMax}$				1.5	V_{DC}
$I_{Leakage}$	Off state leakage current				1	mA_{DC}

AC- Type: MP240D4						
V_{Load}	Load voltage range		24		240	V_{AC}
I_{Load}	Load current				4	A_{AC}
$V_{Dropout}$	Dropout voltage@$I_{LoadMax}$				1.6	V_{AC}
$I_{Leakage}$	Off state leakage current@f_{Load} = 25 to 65 Hz				5	mA_{AC}

Ambient conditions						
	Enclosure type			4X		[4]
	Protection against external mechanical impacts			IK 09		[5]
T_A[6]	Operating temperature range (display does not operate below -4°F/-20°C)		-13 -25		104 40	°F °C
T_{STG}	Storage temperature range		-13 -25		158 70	°F °C

1 The alarm volume is automatically reduced in the case of a weak call signal. For an emission with maximum volume, the call signal must fulfill the following conditions $V_{Ringer} \geq 62\ V_{AC}$ & $f_{Ringer} \geq 30\ Hz$.

2 The hands-free is influenced by ambient noise, an undisturbed conversation is not possible at ambient noise levels $\geq 68\ dB(A)$.

3 Achieved with the help of speech funnels

4 In accordance with UL50

5 In accordance with IEC 50598

6 The function of the display is limited at temperatures below -4°F / – 20 °C.

Standards and regulations (Conformity to the following standards and regulations)	
Radio frequency devices	FCC PART 15
Hearing Aid Compatibility	FCC PART 68
Telecommunications Telephone Terminal Equipment: Technical Requirements for Connection of Terminal Equipment to the Telephone Network	TIA-968-B
Enclosures for Electrical Equipment	UL 50, UL 50E
Information Technology Equipment – Safety	UL 60950-1, UL 60950-22
Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations.	ANSI/ISA-12.12.01-2011

Service

You have purchased a state-of-the-art product, which is subject to stringent quality controls. If you have questions regarding the telephone or if a malfunction has occurred – even after the guarantee period – please contact your supplier or manufacturers representative.

Service – maintenance

The telephone is maintenance-free. Nevertheless, if the telephone is deployed in areas with significant impurities due to dust, grease, oil etc., then it should be cleaned from time to time. The handset and the telephone should be wiped with a damp cleaning cloth. *Caution!* Never use sharp objects for cleaning.

Service – waste disposal

The device may be completely recycled as electronic waste. Upon disassembling the device, the plastic, metal and electronic components must be disposed of separately.
In every single case, the local requirements and regulations for waste disposal must be observed.

Service – warning and safety instructions

This equipment is a telephone specifically designed for operation in a harsh industrial environment. The following warning and safety instructions must be heeded:

1. Do not connect or operate the telephone with voltages other than the voltages specified. Make sure the PE wiring is connected properly. All cabling should be routed such that it does not present a tripping hazard.

2. The telephone must only be operated under the specified ambient conditions (see section "Technical data"). Adverse ambient conditions, such as e.g. ambient temperatures which are to high or to low, are not permissible because this promotes the failure of electronic components.

3. It must be ensured that the telephone, the connection wire etc. are not damaged. It is not permissible to operate the telephone in a damaged state.

4. When operating the telephone, please heed the legal and commercial / industrial regulations, accident-prevention regulations and electrical regulations / provisions.

5. Repairs are only permissible with original spare parts which must be replaced by a specialist. Other replacement parts can cause damage and render the guarantee invalid.

6. The stipulated position of utilisation must be adhered to. The telephone must be installed on a plane surface only, in vertical operating position.

7. Magnetic fields with energy technical frequencies can cause a slight impairment of the listening quality. If this is the case, please ensure that the telephone is installed at a suitable location.

8. The telephone must be switched off before opening. Wait at least 4 minutes after switching off power before opening the telephone!

9. In the open state of the telephone no dust may ingress the device.

10. Upon mounting or demounting the device, do not damage the cover seal, which keeps the cover tight, or the collar on the lower part of the housing.

11. The mouthpiece horn of the receiver consists of a non-conductive plastic material. It may become dangerously charged at high air speeds. Consequently, cleaning the mouthpiece horn with pressurized air is prohibited.

12. If there is a high concentration of sulphurous gases in the environment a rust film can arise.

13. Changes to the product which are in the interests of technical progress are possible even without prior notice.

14. The Programming Interface (10 pins) is only used for programming the internal microcontroller during manufacturing. Neither connect anything to this interface nor short – circuit the pins.

15. **C A U T I O N – To reduce the risk of fire use only No. 26 AWG or larger telecommunication line cable.**
    ATTENTION – Pour réduire le risqué d´incendie, utilisez seulement No. 26 AWG ou ligne de communication plus grande.

16. **This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.**
    Cet appareil est qualifié à être utilize en locaux classes Class I, Division 2, Groups A, B, C, D ou seulement dans les emplacements non-dangereux.

17. **W A R N I N G – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.**
    AVERTISSEMENT – Déconnectez pas l´appareil avant que l´alimentation est mise hors tension ou l´emplacement est considéré à être non-dangereux.

18. **W A R N I N G – Explosion hazard – Substitution of any component may impair suitability for Class I, Division 2.**
    AVERTISSEMENT – Risque d´explosion – Remplacement d´aucun composant peut affaiblir aptitude pour Class I, Division 2.

Identification

FHF
www.fhf.de
Made in Germany
Funke+Huster Fernsig
D - 45478 Mülheim

cULus
LISTED
TELEPHONE FOR USE IN HAZARDOUS LOCATIONS
E304856, 3MSC

Ex ResistTel®

Article № |..............
Environmental Rating: Type 4x
Class I, Divison 2, Groups A,B,C,D   T6
Ambient Range: -4°F to 104°F(-20°C to +40°C)
Electrical ratings: Um= 150VAC,15Hz - 68Hz
REN 1.8B HAC   Um= 56,5VDC; Im=110mA
Appr. .... S-№. ....

WARNING!
Do not open while energized.
Delay time before opening 4 minutes.